

**Claims:**

We claim:

- 5 1. In a system having a data path functional unit having a functional unit data path width, a first memory system having a first data path width, and a second memory system having a data path width which is greater than the functional unit data path width and greater than the first data path width, a method comprising:
- 10 copying a first memory operand portion from the first memory system to the second memory system, the first memory operand portion having the first data path width; and
- 15 copying a second memory operand portion from the first memory system to the second memory system, the second memory operand portion having the first data path width and being catenated in the second memory system with the first memory operand portion, thereby forming catenated data.
- 20 2. The method of claim 1 further comprising reading at least a portion of the catenated data which is greater in width than the first data path width.
- 25 3. The method of claim 2 further comprising specifying a memory specifier from which a plurality of data path widths of data can be read.
4. The method of claim 3 wherein the memory specifier comprises:
- 25 a memory address;
- a memory size; and
- a memory shape.
- 30 5. The method of claim 2 further comprising checking the validity of the first memory operand portion and, if valid, permitting a subsequent instruction to access the first memory operand portion.
6. The method of claim 2 further comprising checking the validity of the second memory operand portion and, if valid, permitting a subsequent instruction to access the second memory operand portion.

7. In a system having a data path functional unit having a functional unit data path width, a first memory system having a first data path width, and a second memory system having a data path width which is greater than the functional unit data path width and greater than the first data path width, a method comprising:

copying a first memory operand portion from the first memory system to the second memory system, the first memory operand portion having the first data path width;

copying a second memory operand portion from the first memory system to the second memory system, the second memory operand portion having the first data path width; and

catenating the second memory operand portion in the second memory system with the first memory operand portion, thereby forming catenated data.

8. The method of claim 7 further comprising reading at least a portion of the catenated data which is greater in width than the first data path width.

9. The method of claim 8 further comprising specifying a memory specifier from which a plurality of data path widths of data can be read.

10. The method of claim 9 wherein the memory specifier comprises:  
a memory address;  
a memory size; and  
a memory shape.

11. The method of claim 8 further comprising checking the validity of the first memory operand portion and, if valid, permitting a subsequent instruction to access the first memory operand portion.

12. The method of claim 8 further comprising checking the validity of the second memory operand portion and, if valid, permitting a subsequent instruction to access the second memory operand portion.

13. In a system having a data path functional unit having a functional unit data path width, a first memory system having a first data path width, and a second memory system having a data path width which is greater than the functional unit data path width and greater than the first data path width, a system comprising:

5 a first copying module configured to copy a first memory operand portion from the first memory system to the second memory system, the first memory operand portion having the first data path width; and

a second copying module configured to copy a second memory operand portion from the first memory system to the second memory system, the second memory  
10 operand portion having the first data path width and being catenated in the second memory system with the first memory operand portion, thereby forming catenated data.

14. The system of claim 13 further comprising a reading module configured to read at least a portion of the catenated data which is greater in width than the first data path  
15 width.

15. In a system having a data path functional unit having a functional unit data path width, a first memory system having a first data path width, and a second memory system having a data path width which is greater than the functional unit data path  
20 width and greater than the first data path width, a system comprising:

a first copying module configured to copy a first memory operand portion from the first memory system to the second memory system, the first memory operand portion having the first data path width; and

a second copying module configured to copy a second memory operand portion  
25 from the first memory system to the second memory system, the second memory operand portion having the first data path width.

16. The system of claim 15 further comprising a catenating module configured to catenate in the second memory system the second memory operand portion with the  
30 first memory operand portion, thereby forming catenated data.

17. The system of claim 16 further comprising a reading module configured to read at least a portion of the catenated data which is greater in width than the first data path width.